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**UNIVERSITI TUN HUSSEIN ONN MALAYSIA**

**FINAL EXAMINATION  
SEMESTER II  
SESSION 2023/2024**

- COURSE NAME : WORKSHOP TECHNOLOGY
- COURSE CODE : BBM 10203
- PROGRAMME CODE : BBM
- EXAMINATION DATE : JULY 2024
- DURATION : 3 HOURS
- INSTRUCTIONS :
1. ANSWER ALL QUESTIONS
  2. THIS FINAL EXAMINATION IS CONDUCTED VIA
    - Open book
    - Closed book
  3. STUDENTS ARE **PROHIBITED** TO CONSULT THEIR OWN MATERIAL OR ANY EXTERNAL RESOURCES DURING THE EXAMINATION CONDUCTED VIA CLOSED BOOK

THIS QUESTION PAPER CONSISTS OF **FOUR (4)** PAGES

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- Q1** (a) Explain how hacksaw blade teeth per inch (TPI) can affect the cutting process such as cutting speed, surface finish, material compatibility, chip removal and blade life.

Terangkan bagaimana gigi pisau gergaji besi per inci boleh mempengaruhi proses pemotongan seperti kelajuan pemotongan, kemas permukaan, keserasian bahan, penyingkiran serpihan dan hayat bilah.

(6 marks)

- (b) Complete the Q1. in your answer sheet and show three (3) characteristic that differentiate the definition of speed rate and cutting speed in drilling processes.

Lengkapkan semula Jadual Q1. dalam kertas jawapan anda dan nyatakan tiga (3) ciri yang membezakan definisi kadar kelajuan dan kelajuan pemotongan dalam proses penggerudian.

**Table Q1** Definition of speed rate and cutting speed.

Speed rate	Cutting speed

(7 marks)

- (c) Grinding machines are power tools employ abrasive wheels that remove tiny amounts of material to achieve a smooth, polished surface. Explain four (4) principles of grinding.

Mesin pengisar ialah alat kuasa yang menggunakan roda yang melelas yang mengeluarkan sejumlah kecil serpihan untuk mencapai permukaan yang licin dan berkilat. Terangkan empat (4) prinsip pengisaran.

(12 marks)

- Q2** (a) A fastener is a hardware device or component used to mechanically join or secure non-permanently two or more objects together.

- (i) Identify four (4) types of fasteners that commonly used in the workshop activities.

Kenal pasti empat (4) jenis pengikat yang biasa digunakan dalam aktiviti bengkel.

(4 marks)

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- (ii) What are the others primary function of using fasteners beside joining two or more component non-permanently?

Apakah fungsi utama yang lain untuk menggunakan pengikat selain menyambung dua atau lebih komponen secara tidak kekal?

(5 marks)

- (b) Classify and explain four (4) of the thread functions.

Kelaskan dan terangkan empat (4) fungsi benang.

(8 marks)

- (c) Discuss four (4) risk that can occurs with power saw machine if the guard been removed or not properly in place.

Bincangkan empat (4) risiko yang boleh berlaku dengan mesin gergaji kuasa jika pengadang telah ditanggalkan atau tidak dipasang dengan betul.

(8 marks)

- Q3** (a) List three (3) types of common cutting fluids categories used in machining processes.

Senaraikan tiga (3) jenis kategori cecair pemotong yang biasa digunakan dalam proses pemesinan

(3 marks)

- (b) State four (4) items related to environment and safety consideration when handling the cutting fluids.

Nyatakan empat (4) perkara berkaitan alam sekitar dan pertimbangan keselamatan semasa mengendalikan bendalir pemotong.

(4 marks)

- (c) Compare the advantages and disadvantages of using water-based and oil-based cutting fluids in facilitating the machining processes.

Bandingkan kebaikan dan keburukan menggunakan cecair pemotong berasaskan air dan berasaskan minyak dalam memudahkan proses pemesinan.

(8 marks)

- (d) Explain the differences between Brinell and Vicker hardness test in terms of the principle, procedure, and application.

Terangkan perbezaan antara ujian kekerasan Brinell dan Vicker dari segi prinsip, prosedur dan aplikasi.

(10 marks)

**TERBUKA**

- Q4** (a) Indicate five (5) steps in soldering process.  
Nyatakan lima (5) langkah dalam proses pematerian.  
(5 marks)
- (b) State and explain four (4) of the heat treatment processes that are commonly used in metallurgy and materials engineering.  
Nyatakan dan terangkan empat (4) proses rawatan haba yang biasa digunakan dalam metalurgi dan kejuruteraan bahan.  
(8 marks)
- (c) Describe in detail the key safety precautions that should be implemented before, during, and after a heat treatment process.  
Terangkan secara terperinci langkah keselamatan yang perlu dilaksanakan sebelum, semasa dan selepas proses rawatan haba.  
(12 marks)

- END OF QUESTIONS -

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